CLAIMS

1.   A method for producing an artifact-corrected image of a negative jaw impression in a recipient jaw, comprising;

        forming a negative impression of said recipient jaw;

        producing a first digital image of said negative jaw impression;

        producing a second digital image, including said artifacts, of said negative jaw impression in said recipient jaw;

        using said first digital image to produce an artifact-corrected computer representation of said negative impression in said recipient jaw.

2.   The method of claim 1, comprising adjusting said negative jaw impression during formation to allow easy manipulation of said impression on said recipient jaw.

3.   The method of claims 1 or 2 comprising setting one or more tooth implant models in said negative jaw impression, prior to producing said images.

4.   A method of any of the previous claims comprising incorporating one or more reference markings in said negative jaw impression wherein said reference markings are visible in said first and second images.

5.   A method according to claim 4, wherein said reference markings comprise one or more of the following; one or more points, one or more edges, one or more planar edges or one or more line segments.

6.   The method of any of the previous claims wherein said first and second digital images comprise voxels.

7.   The method of any of the previous claims comprising aligning the voxels of said first digital image with the voxels of said second digital image.

8.   The method of any of the previous claims comprising aligning the voxels of said first digital image with the voxels of said second digital image using one or more of said reference markings in said first and second images.

5   9.   The method of any of the previous claims comprising using alignment software to align said first digital image with said second digital image.

10.   The method of any of the previous claims comprising substituting the voxels of said first digital image for said aligned voxels of said second digital image.

10

11.   The method of any of the previous claims comprising forming an image comprised of ₒthe upper portion of the first image and the lower portion of the second image wherein said upper portion is free of said artifacts.

15   12.   A method according to any of the previous claims comprising setting one or more drilling trajectories in said artifact-corrected computer representation.

13.   A method according to any of the previous claims comprising using said artifact-corrected computer representation to produce a drilling template.

20

14.   A method according to claim 13, comprising including one or more drill bore guides in said drilling template.

15.   A method according to any of claims 1-13, comprising using said artifact-corrected

25   computer representation to produce a model of said recipient jaw.

16.   A method according to claim 15, comprising placing one or more drill bores in said recipient jaw model.

30   17.   A method according to claim 15 or claim 16, comprising using said model of said recipient jaw to produce a drilling template.

18.   A method according to any of claims 15-17, comprising using said negative impression of said recipient jaw to produce said drilling template.

19.   A method according to claim 17 or claim 18, comprising placing one of more drill bore guides into said drilling template.

20.   A method for producing a model of a recipient jaw from which a drilling template is machined, comprising;

   producing a 3D digital image of said recipient jaw;

   placing bore trajectories in said 3D digital image; and

   producing a model of said recipient jaw from said 3D digital image.

21.   The method according to claim 20, comprising modifying said 3D digital image to allow easy manipulation within said recipient jaw.

22.   A method according to claim 20 or claim 21 comprising producing a negative template of said model.

23.   A method according to any of claims 20-22, comprising boring said recipient jaw model to produce boring trajectories within said negative template.

24.   A method according to claim 20, wherein said model of said recipient jaw contains representations of one or more of the following structures; nerves, bone, teeth, cartilage and/or soft tissue.

25.   A method according to claim 24, comprising using said jaw model with representations to produce boring trajectories within said negative template.

26.   A method according to any of claims 20-25, comprising placing said drilling template in said recipient jaw, making an image and determining that it seats properly in said recipient jaw.

27.   A method according to any of claims 20-26, comprising placing said drilling template in said recipient jaw, making an image and determining that the planned trajectories are properly aligned.

28.   A method according to any of claims 20-27, comprising aligning an image of said drilling template on a model of said recipient jaw.

29.   A method according to any of claims 20-28, comprising comparing an image of said drilling template aligned on a model of said recipient jaw and determining that said drilling template seats properly.

30.   A method according to any of claims 20-29, comprising placing said drilling template in said recipient jaw and using said drilling template to drill implant receiving bores in said recipient jaw.

31.   A digital image merging system, comprising:

       a) a first input adapted to receive a first digital image of a recipient jaw including artifacts;

       b) a second input adapted to receive a second digital image of a negative impression of said jaw; and

       a digital merging unit adapted to receive and merge said first and second digital images to form a reproduced image having reduced artifacts with reference to said first image.

32.   The system according to claim 31, including a tooth implant model setter that sets one or more tooth implant models in said negative jaw impression, prior to producing said images.

33.   The system according to claim 31 or claim 32, including one or more reference markings in said first and second images, wherein said digital merging unit merges said first and second images using said one or more markings.

34.   The system according to any of claims 31-33, wherein said first and second digital images comprise voxels images.

35.   The system according to claim 34, wherein the digital merging unit comprises a voxel image alignment module that aligns the voxels of said first image with the voxels of said second image.

36.   The   system according to claim 35, wherein said software comprises a voxel substituting module that substitutes at least a portion of the voxels in said first digital image for at least a portion of the voxels in said second digital image.

37.   The system according to claims 35-36, wherein said software comprises an image conglomerator that conglomerates one portion of said first image with a portion of said second image wherein said image portions are non-inclusive of each other.

38.   The system according to claim 37, wherein said image conglomerator conglomerates an upper portion of said first image and a lower portion of said second image.

39.   The   system according to claims 35-38, wherein said software comprises a drill trajectory imposer that imposes one or more drilling trajectories in said artifact-reduced image.

40.   The system according to any of claims 31-39, wherein said system includes a drilling template modeler that receives said reproduced image and models a drilling template based upon said image.

41.   The system according to any of claims 31-40, wherein said drilling template modeler comprises a fast prototyping machine.

42.   The system according to claim 40, wherein said drilling template modeler comprises a negative impression modifier that modifies a negative impression to produce a drilling template.

43.   The system according to claim 42, wherein said drilling template modeler comprises a drilling machine that drills said negative impression to produce said drilling template.

23